METHODOLOGY FOR DEVELOPING LOGICAL THINKING SKILLS OF FUTURE TEACHERS BASED ON NEURO-PEDAGOGICAL APPROACHES

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Abstract: This article analyzes the scientific and methodological foundations for the formation and development of logical thinking skills in future teachers based on neuro-pedagogical approaches. The integrative approaches characteristic of the modern education system are reflected in the synthesis of neurobiological knowledge, psycho-pedagogical methods, and interactive technologies. Logical thinking is considered one of the key cognitive competencies that determine the professional potential of a teacher's personality.

Keywords: neuro-pedagogy, logical thinking, cognitive competencies, educational technologies, future teacher.

Introduction

In the 21st century, the demands placed on the teaching profession have undergone fundamental changes. Teachers are now required not only to possess solid theoretical knowledge and practical skills but also to demonstrate a high level of intellectual culture — including analytical, critical, and especially logical thinking abilities. From this perspective, the development of logical thinking potential in future teachers through innovative and neuro-pedagogical approaches has become a pressing scientific and methodological issue within the pedagogical education system.

Neuro-pedagogy is an interdisciplinary field combining neuroscience, psychology, and pedagogy. It focuses on organizing learning activities based on the functioning of the human brain. This approach not only takes into account students' individual learning capacities but also serves to deeply explore and develop their cognitive structures.

Theoretical Foundations of Neuro-Pedagogical Approaches

Neuro-pedagogy is interpreted in scientific literature as a methodological system that integrates the neurophysiological and psychological mechanisms of brain activity with the learning process [1]. The main principles of this approach include:

1. **Considering individual neuroprofiles**: Accounting for each student's unique learning style and brain activity characteristics.
2. **Multisensory (multimodal) learning**: Conveying knowledge through various sensory channels to enhance deeper and more effective understanding.
3. **Emphasis on emotional cognition**: Recognizing the influence of emotional states on learning processes. Reducing stress and enhancing motivation improves learning efficiency at the neurochemical level.
4. **Metacognitive regulation**: Developing the ability to analyze, control, and manage one's cognitive activities.

Stages of Developing Logical Thinking Skills

Logical thinking refers to the process of identifying cause-and-effect relationships between phenomena, events, or concepts, generalizing information, and drawing reasoned conclusions. The neuro-pedagogical approach proposes the development of logical thinking through the following sequential stages:

1. **Stimulating analytical thinking**: Critically examining problem situations.
2. **Developing hypothetical thinking**: Proposing and testing various hypotheses.
3. **Structured thinking**: Systematizing information flow and expressing logical connections.
4. **Reflective thinking**: Evaluating one's learning activities through the analysis of personal thoughts and decisions.

To implement these stages effectively, cognitive methods such as "mind maps," "De Bono's Six Thinking Hats," and the "SCAMPER" approach are recommended.

Practical Methods and Technologies

The following interactive and neuro-pedagogical technologies are highly effective in shaping logical thinking:

- **Mind mapping**: A graphical method that illustrates logical connections between concepts.
- **Digital tools**: Organizing interactive sessions using platforms like Padlet, Quizizz, Miro, and MindMeister.
- **Problem-based simulations**: Exercises in decision-making within scenarios close to professional practice.
- **Techniques like "Thought Circles" and "Contradictory Questions"**: Activating thinking through opposing viewpoints.

Conclusion

The formation of logical thinking skills in future teachers is a crucial stage in their professional preparation. Organizing this process based on neuro-pedagogical approaches not only enhances the efficiency of education but also ensures personal development. Through neuro-pedagogical methods, learners' cognitive potential is thoroughly examined, and their thinking culture is shaped based on individual approaches. Therefore, integrating this approach into pedagogical practice should become an integral part of modern education.

References

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